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## 4. General Fibonacci

**Program Name: GeneralFib.java**

**Input File: generalfib.dat**

The boys in the field are intercepting messages from the evil General Fibonacci and sending them back home for you to decrypt. After years of code breaking, Commander Wythoff has discovered that General Fibonacci uses a formula to encrypt his numbers. The formula has two “base numbers” called  $x$  and  $y$  such that  $f(1) = x$  and  $f(2) = y$ . His formula also has “coefficient numbers,”  $a$  and  $b$  which gives the function its definition for the rest of the numbers.  $f(n) = a * f(n - 1) + b * f(n - 2)$ .

Given  $x$ ,  $y$ ,  $a$ ,  $b$ , and  $n$ , find  $f(n)$  in order to help the war effort.

### Input

The file begins with an integer  $T$  ( $1 \leq T \leq 100$ ), the number of test cases. After that,  $T$  test cases follow. Each test case has 5 numbers in a single line,  $x$ ,  $y$ ,  $a$ ,  $b$ , and  $n$ . It is guaranteed that  $f(n) < 10^9$ .

### Output

For each test case, print a single line with the value of  $f(n)$ .

### Example Input File

```
3
0 1 1 1 5
2 1 1 1 7
0 1 1 2 6
```

### Example Output to Screen

```
3
18
11
```

### Example Output Explanation

The first sequence begins 0, 1, 1, 2, 3, 5, 8, 13, ... In this sequence, the fifth element is 3.